Related Resources

Clinical articles on this topic

Return to Medscape coverage of: Heart Failure Society of America - 7th Annual Scientific Meeting

Email this Article | Print this Activity for Offline Reference

REDHOT: Rapid Emergency Department Heart Failure Outpatient Trial

Disclosures

Linda Brookes, MSc

First results of the Rapid Emergency Department Heart Failure Outpatient Trial (REDHOT) show that testing for brain natriuretic peptide (BNP) when evaluating congestive heart failure (CHF) patients can prevent inappropriate hospital admissions and discharges.[1] Presenting the results of the first phase of REDHOT, Alan S Maisel, MD (San Diego VA Healthcare System, California) said the trial demonstrated a "strong disconnect" between the perceived severity of CHF cases by emergency department physicians and severity as determined by BNP levels.

REDHOT is a 2-phase, multicenter trial aimed at demonstrating the utility of using BNP testing to manage heart failure patients in the emergency department. In the first phase, 464 patients visiting emergency departments with complaints of breathing difficulty had BNP measurements taken on arrival, then every 3 hours in the emergency department, as well as at the time of hospital admission or discharge. Physicians were only informed whether the initial BNP level was greater or less than 100 pg/mL. They were blinded to subsequent BNP results.

Patients discharged from the emergency department had higher BNP levels than those admitted to hospital. The median BNP level for discharged patients was 976 pg/mL, 27% higher than the mean BNP level for patients who were admitted to hospital (766 pg/mL).

Approximately 90% of all patients were admitted to hospital from the emergency department. Of the admitted patients, 11% had BNP levels < 200 pg/mL, which is indicative of less severe CHF that typically does not require hospitalization. Mortality for these patients was 0% at 30 days and only 1% at 90 days.

About 10% of all patients were ultimately discharged home. Of these, 78% had BNP levels > 400 pg/mL. At 30 days, mortality in these patients was 0%, but at 90 days, mortality was 9%. Published studies suggest that patients with BNP levels of 230-480 pg/mL could be at significant risk for mortality or readmission.

Dr. Maisel also pointed out the savings in costs that could result with use of the BNP test in this situation. With total inpatient costs for heart failure running about $46 billion annually in the United States, savings based on the 11% of patients in this study with BNP < 200 pg/mL who need not have been hospitalized could be over $500 million.

Dr. Maisel believes that the using the BNP test would identify the patients in whom heart failure could be ruled out (BNP < 100 pg/mL), patients who could likely be managed in the emergency department and discharged if their condition improved (BNP 100-400 pg/mL), and patients who should be considered for hospitalization (BNP > 400 pg/mL).

REDHOT is the first large clinical trial to examine BNP in relation to physician decision making, patient disposition, and critical outcomes in the emergency medicine setting," Dr. Maisel said. The second phase of the REDHOT study is expected to start by the end of 2003. Enrollment is expected to be completed within 6 months. In this phase of the study, physicians will not be blinded to BNP concentrations.

BASEL Findings Support REDHOT Results

The results of a similar European study, the B-type Natriuretic Peptide for Acute Shortness of Breath Evaluation (BASEL), were recently reported at the European Society of Cardiology Congress in Vienna.[2] The BASEL investigators found that in 425 patients admitted to an emergency department with shortness of breath, 225 of whom were randomized to rapid BNP measurement, BNP testing reduced hospitalizations, the need for intensive care, and total treatment time. Total treatment costs were reduced significantly by 25%. In BASEL, however, physicians were not blinded as to BNP test results.

References

1. Maisel AS. Primary results of the Rapid Emergency Department Heart Failure Outpatient Trial (REDHOT). A multicenter trial examining BNP levels, emergency physician decision-making and outcomes in patients presenting with shortness of breath. Late Breaking and Recent Clinical Trials. Presented at the 7th Annual Meeting of the Heart Failure Society of America; September 21-24, 2003; Las Vegas, Nevada.
2. Muller C. Brain natriuretic peptide for Acute Shortness of breath EvaLuation: a randomized comparison (BASEL). Presented at the ESC Congress 2003; August 30-September 3, 2003; Vienna, Austria. Hot Line I: Medical Treatment/Heart Failure, Presentation #84.